

**CORRES. CONTROL**  
**INCOMING LTR NO.**

00489 RF 05

**DUE DATE**

## ACTION

RECEIVED



2295 OCT -5 P 3: 55

**Department of Energy**

**ROCKY FLATS PROJECT OFFICE  
12101 AIRPORT WAY, UNIT A  
BROOMFIELD, COLORADO 80021-2583**

**OCT 04 2005**

05-DOE-00590

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COR. CONTROL	X	X
ADMIN. RECORD	X	X

Reviewed for Addressee  
Corres. Control RFP

Date 10/5/03 By gc

Ref. Ltr. #

**DOE ORDER #**

5400.1

**Mr. Carl Spreng**  
**Rocky Flats Cleanup Agreement Project Coordinator**  
**Colorado Department of Health and Environment**  
**4300 Cherry Creek Drive South**  
**Denver, Colorado 80246-1502**

**Mr. Mark Aguilar**  
**Rocky Flats Cleanup Agreement Team Lead**  
**U.S. Environmental Protection Agency, Region VIII**  
**999 18<sup>th</sup> Street, Suite 300**  
**Denver, Colorado 80202-2466**

**Dear Gentlemen:**

The U.S. Department of Energy (DOE) Rocky Flats Project Office is transmitting to your respective agencies copies of the Final Response to Comments on the Draft Closeout Report for IHSS Group 000-5 Present Landfill (IHSS - 114), which includes the Final Construction Certification Report - Accelerated Action Closure of the Present Landfill.

**If you should have any questions regarding this document, please contact Bob Birk at (303) 966-5921, or you may contact me at (303) 966-6246.**

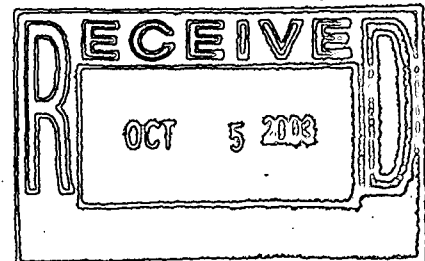
Sincerely,

**John J. Rampe, Director**  
**RFPO Closure Project Management**

**Enclosure:**  
**as stated**

cc w/Encl.:  
R. Birk, HQCPM, RFPO  
P. Smith, USEPA  
Administrative Record

cc w/o Encl.:  
D. Shelton, K-H  
B. Davis, K-H



## ADMIN RECORD

**BZ-A-000872**

**RESPONSE TO CDPHE COMMENTS**  
**DRAFT CLOSEOUT REPORT FOR IHISS GROUP 000-5**  
**PRESENT LANDFILL (IHISS-114)**  
**JUNE 2005**

Revised 09/21/2005

General Comments		
No.	Comment	Response
1	The terms in the document are not always consistently used either within the document itself, or with respect to the previously submitted and approved design documents. For example, the layer above the 12-inch rock layer is called the "24-inch infiltration soil layer" in the design and shown on Drawing 13A. The same layer is called the "cover soil" in Section 4.11 of the subject report. Most of the time, however, that layer is called "Rocky Flats Alluvium". This and other terms should be checked and changed for consistency throughout the entire document.	Nomenclature has been change to consistently refer to this layer as the cover soil layer.
2	The submittals in Appendix D have been placed in chronologic order, without a subject index, table of contents, dividers, or other means to easily locate a specific submittal of interest. This makes this section extremely difficult to use. Please provide a means to efficiently utilize this Appendix for the final report. Also, since all of the submittals shown in the Submittal Log have not been included with this report, the Submittal Log should somehow indicate which are included and which are not.	The submittal log will indicate which submittals are in the appendix and each submittal in the appendix will be divided with blue paper.
3	Project nonconformance items must be included in the Final Certification Report. Although the Draft report does not list any project nonconformance items, detailed below in this comment package are items that CDPHE found to be beyond the approved design package (i.e., design analysis, specifications, drawings, and QA/QC Plan). Some items considered as a nonconformance are results of quality tests that failed the project requirement (i.e., soil moisture content outside of a specified range), while other	A non-conformance section has been added to Section 6.

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	<p>nonconformance items are more procedural (i.e., review of daily QC Report by CQAE). While we acknowledge that procedural items may not have directly affected the ultimate suitability of the final cover, any item beyond the regulatory approved project requirements must be considered a nonconformance item, and must be addressed in the final report. Please add a section to the final report discussing all of the items indicated below as project nonconformances.</p>	
4	<p>Appendix F contains the Quality Control (QC) documentation, including the Daily QC Reports (Appendix F-1). Each and every Daily QC Report was apparently reviewed and approved by the Quality Control Site Manager (QCSM) on May 16, 2005. The first Daily QC Report was generated September 1, 2004, but not reviewed and approved until after 9 months passed. CDPHE is extremely concerned that this lack of timeliness did not provide real "quality" to the project, and believes that this is also a nonconformance item. Section 2.1 of the approved Construction Quality Assurance Quality Control Plan (QA/QC Plan) states: "The QCSM's <i>daily</i> activities will include assimilation of data for, and preparation of, the Daily QC Report...". This daily activity was apparently not performed.</p>	<p>All Quality Control functions were performed by Stoller and Golder. The QCSM was involved throughout the project from beginning to end as documented in all the construction work control documents. The QC daily reports were prepared by Golder, and reviewed by both the QCSM and the QASM on a daily basis. However, there was some confusion on who was to sign the daily QC reports, which is reflected in the signed QC reports in the CCR by the Stoller representative.</p>
	<p>In addition, the Construction Quality Assurance Engineer (CQAE) or the Site Quality Assurance Manager (SQAM) should have reviewed the Daily QC Report. Section 2.1 of the approved QA/QC Plan also states: "The SQAM will complete a Daily QA Report and <i>review the Daily QC Report</i>". There is no indication that this requirement was ever performed. In addition, we would have expected the SQAM to inform the QCSM of the requirement for</p>	

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	preparation of the QC Daily Report. This lack of review on a daily basis of the Daily QC Report by the SQAM also appears to be a project nonconformance.	
5	For the Record Survey portion of the report (Appendix L), all cover layers requiring a minimum thickness (i.e., 6-inch cushion soil, 10-inch cushion soil, 12-inch rock layer, and 24-inch infiltration soil layer) should clearly show that the thicknesses have been achieved. This should include the surveyed elevation of the bottom of the layer, the surveyed elevation of the top of the layer, and another column showing the difference between the top and bottom elevation at each and every coordinate point to verify minimum thickness. This information should be added to the soil component spreadsheets.	Columns have been added to the record survey tables to show the thickness of the various soil layers. The top of the GDN was surveyed before the 10-inch cushion soil was placed; however, the thickness of the geosynthetics is considered to be 0.04 feet.
	The requested information and format can be easily transposed from the existing information contained in the Appendix L spreadsheets, except for the 10-inch cushion soil above the geosynthetics. For this layer, there are no elevations provided for the bottom of the 10-inch cushion soil (or top of the GDN). Please review and explain how the minimum thickness of the 10-inch layer will be certified.	
<b>Specific Comments – Closeout Report</b>		
6	Section 1.0, page 2, 5 <sup>th</sup> paragraph – This paragraph should also state that approval of this Closeout Report constitutes regulatory closure of this RCRA-regulated unit.	Text has been added to clarify this point.
7	Section 2.1, page 6 – a) 5 <sup>th</sup> bullet – Clarify that the activity in this bullet was for placement of material for use as gradefill only. b) 8 <sup>th</sup> bullet – This bullet should be described as GCL, not geosynthetics. c) The geocomposite drainage net should have its own “bullet” rather than shown	The bulleted list of construction activities has been revised for clarity.

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	under geomembrane. d) The "cover soil" term should be described as "24-inch infiltration soil".	
8	Section 3.0, page 7 – Add to this paragraph that acceptance of closeout report with its construction certification report constitutes closure of this RCRA-regulated unit in accordance with CHWA 1007-2, part 265.	Text has been added to clarify this point.
9	Section 4.0, page 7 – A more logical order may be to put Section 4 – Stewardship Analysis after Section 7 – Site Reclamation.	The order of the closeout report has been changed.
10	Section 8.0, page 9 – Add to the last sentence: "Justification is based on the successful completion of the construction of the RCRA C compliant cover <i>such that the approved RAOs were satisfied</i> ."	Text has been added to clarify this point.
<b>Specific Comments – Construction Certification Report</b>		
11	Title Page, following blue separator sheet – This page is titled "Draft Closeout Report", but it should be "Certification Report". Please check and correct.	Title pages have been changed for the CCR.
12	Section 1.1, page 1, 3 <sup>rd</sup> paragraph – The last sentence states that the landfill received about 20 cubic yards of <i>compacted</i> waste per day. Clarify in the text that the waste was received at the landfill and then compacted. The current language implies that the waste was compacted prior to being received at the landfill. Same comment for the Closeout Report, Section 1.1, 1 <sup>st</sup> paragraph.	Text has been modified to clarify this point.
13	Section 1.4.5, page 4 – Please further describe the division of responsibilities between Stoller and Golder personnel. It is stated that Golder performed all CQC field and laboratory testing for earthworks and geosynthetics. What was Stoller's role in QC?	Text has been added throughout the CCR to clarify the QC roles.
14	Section 2.0, page 5 – Describe what role the Hold Point / Release process had in allowing various layers to be built	Text has been added to further clarify the process.

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	concurrently.	
15	Section 2.2.1, page 6 – Similar to Comment 1, the terms used should be consistent with the design drawings. The layer described as “22-inch RF alluvial” should be called “infiltration soil layer”. Also, the “RF alluvial subgrade” should be called “gradedfill” or another term that is less confusing. Remember that Rocky Flats Alluvium(al) is a mapped geologic unit, and not specifically an engineered component of the cover system.	Nomenclature has been changed to consistently refer to this layer as the soil cover layer.
16	Section 2.3, page 6 – Please describe why the exploratory borings were drilled for this project, and the results/conclusions of the borings.	Text has been added to clarify the role of the borings at the east face. These boring were completed between September 14 and September 29, 2004.
17	Section 4.3, page 11 – Please further describe how the referenced borings were utilized to determine and repair soft spots. Were samples taken? Were boring logs written? How deep were the borings? Add appropriate details to this section.	Text has been added to clarify the role of these borings.
18	Section 4.4, page 11 a) The term “sheepsfoot roller” to describe the compaction equipment used is inaccurate. An actual sheepsfoot compactor has a longer “neck” and more spherical or elongated “foot”. The better term for the heavy compaction equipment used is “pad foot” or “tamping foot” compactor. Please remove references to the “sheepsfoot” compactor or roller within this section and all other sections of this report.	Text has been added to clarify the description of the roller used.
	b) Also, “proof rolling” is the term used to visually observe deflection after an area has been compacted. This section states that the area was proof rolled to achieve stability. The term “proof rolled” in this paragraph should be replaced with “compacted” or something similar.	Text has been added to clarify the proof-rolling process.
19	Section 4.5.2, page 12 – Prior to mixing the wet material	Text has been added to clarify this activity.

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	with the cement kiln dust (CKD) adjacent to the pond, some material was mixed with CKD on top of the landfill. Please include a description and summary of this activity, and reference the approved work plan for this task. Also, the treatment of the wet material on top of the landfill, rather than within the pond area as the approved plan required, was a project nonconformance.	
20	Section 4.5.4, page 13 – The term “buttress” should be clarified.	Text has been modified for clarity
21	Section 4.6, page 13 – Further describe the gradefill (RFA) beyond “rocky materials”. Include the range of sizes, classification(s) according to ASTM, and other geotechnical parameters pertinent to the material. Also, clarify that the 1-inch deflection discussed in this section was determined visually rather than with survey instrumentation.	Text has been added to clarify these points.
22	Section 4.8.1.1, page 15, 2 <sup>nd</sup> complete paragraph – Further describe the portions of the geosynthetics clay liner (GCL) that were removed due to hydration. Where were they located? A drawing may be helpful. How were the sections to be removed determined?	Reference to the appropriate appendices has been added to clarify the repair of the GCL.
23	Section 4.8.1.1, page 15, last paragraph – It is stated that “various” sections of the GCL were inspected for defects prior to placement of the flexible membrane liner (FML). CDPHE assumed that all of the placed GCL sections were inspected for defects. Please check and clarify.	Text has been modified to state that all sections were inspected.
24	Section 4.8.2.1, page 16, 1 <sup>st</sup> paragraph – It is stated that the FML panels were “rolled into place”. This requires some further explanation. Please discuss the initial deployment of the FML using the Bobcat bucket, particularly with respect to damage and subsequent repair of the material prior to restricting the use of the Bobcat for deploying FML. Photo	Text has been modified for clarity.

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	20 in Appendix C shows the Bobcat being used for FML deployment.	
25	Section 4.8.3, page 18, 2 <sup>nd</sup> paragraph – It is not clear how the damaged GDN was repaired. Please clarify what is meant by “Such areas were repaired using a geotextile under the hole...”. Also, the last sentence states that a new 3-layer GDN section was welded over the damaged area. The purpose of the GDN is to drain water. If a new section was welded “over” the damaged section, how could water drainage occur? Please clarify what happened. A drawing or sketch may also be useful to show how this area was repaired.	Text has been modified for clarity.
26	Section 4.12.2, page 20, 1 <sup>st</sup> paragraph – It is stated that a geotechnical engineer determined that the excavation reached sound materials. Please explain the role that QC and QA had in this determination.	Text has been modified for clarity.
27	Section 4.12.4, page 22 – What does the acronym “PE” represent? In the list of acronyms shown at the beginning of the document, PE is listed as Professional Engineer. Obviously that is incorrect in this context. Please check and clarify.	Text has been modified for clarity.
28	Section 4.13, page 23, 2 <sup>nd</sup> paragraph – Please explain how the seep flows of less than 1 gpm were determined. Is this flow consistent, or does it vary? Provide additional details. Also, discuss the change made by K-H to eliminate the flow meter.	Text has been modified for clarity. Spot checks of the flow has shown that the flows are consistently low (less than 1 gpm). It is not the purpose of the CCR to make statements about the future monitoring of the flows. Measurement of the seep flow will be addressed in the PLF Monitoring and Maintenance Plan. The change in the flow measurement method is discussed in Section 5.
29	Section 4.13, page 23, last paragraph – Provide a reference to the Appendix where the results of the concrete tests (slump, air entrainment, compressive strengths, etc.)	Text has been modified and the concrete strength issue has been added as a non-conformance item in Section 6.



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	discussed in this section are located. Also, even though the design engineer determined that 3000 psi compressive strength was acceptable, the material did not meet the approved specification, and therefore must be considered a project nonconformance.	
30	Section 4.19, page 26 – This summary of quantity used as presented is difficult to read and understand. Please create a table or spreadsheet for this information, and identify the units used. For example, does “T” mean tons? Also, separate individual components. The cushion soil quantities for the 6-inch and 10-inch layers should be listed separately. Drainage rock and bedding are different materials (1-inch minus and ½-inch minus), and should also be shown as different quantities. Please check all entries and revise for clarity.	A table has been added to the CCR and all quantities have been checked.
31	Section 5.1, page 28, 3 <sup>rd</sup> paragraph – Please reference the Appendix where the grain size analyses results discussed in this section are located. Also, the acronym “GSA” should be listed in the Acronyms and Abbreviations section of the report.	Reference has been added and the acronym has been defined.
32	Section 5.2, page 30, 3 <sup>rd</sup> complete paragraph – The word “inches” should be added after the value “0.5”.	This is a ratio of height and width and is a unit-less number.
33	Section 5.3, page 33, 2 <sup>nd</sup> paragraph – Please clarify the “original embankment” discussed at the end of the first sentence was not part of the work for the Present Landfill cover project, but rather the embankment was constructed in the past during operation of the landfill while it was accepting waste.	Text has been modified for clarity.
34	Section 5.4, page 35, 11 <sup>th</sup> Field Change – CDPHE disagrees with the reason stated in this paragraph as to why the change was made. As you know, the regulatory agencies	Text has been added to refer to the certifying engineer of the CCR.

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	are the parties that ultimately accept or not accept the certification that the Present Landfill final cover project is complete. In discussions with Kaiser-Hill (K-H) during the time this change was considered, both CDPHE and EPA indicated a willingness to accept certification that the minimum 22-inch thickness of the infiltration soil layer was acceptable using survey instruments, along with subsequent measurements of the thickness of the 2-inch layer using a scale or other non-typical survey instrument means. However, K-H independently determined that an instrument survey must be performed on the full 24-inches for certification, thus, the agencies' preferred method of soil placement for the 22-inch/2-inch infiltration layer was unable to be implemented. The agencies did not concur with the K-H method or reason during the time of implementation. Therefore, please change the wording of this paragraph to indicate that the change was made for the convenience of K-H and their subcontractor, and remove the reference to being required for certification.	
35	Section 6.1.3, page 39, 2 <sup>nd</sup> paragraph – The 26 QC tests performed on Rocky Flats Alluvium using ASTM D 422 are all invalid, because the tests were not performed according ASTM D 422 requirements. Representative samples of the RFA, including the testing of particles greater than 3-inches, are not considered when using ASTM D 422. This should be discussed in this paragraph.	Text has been modified for clarity. Note that the ASTM D422 testing was performed correctly for the intended purpose of determining consistency between the sources of Rocky Flats Alluvium used during construction. ASTM D5519 was added at the request of the regulatory agencies to obtain "as-built" conditions of the Rocky Flats Alluvium used for the PLF final soil cover.
36	Section 6.1.4, page 40, 3 <sup>rd</sup> paragraph – Rather than stating that "almost all" of the seam vacuum tests passed, the actual numbers should be presented. A reference to the location of all of the tests in the report should then be given.	Text has been modified for clarity.
37	Section 6.2.4, page 42, 2 <sup>nd</sup> paragraph – This section	Text has been modified for clarity.

	<p>indicates that two field gradation tests were not within specifications. The section is not clear as to the disposition of these two failing tests. The paragraph then states that the material gradations were within specifications, according to a subsequent field test. This is confusing. Please explain clearly what happened and the current condition of the in-place material.</p>	
38	<p>Section 8.1, page 45 – This section states that the QCSM or <i>assistant</i> QCSM prepared the QC Daily Report. This is not consistent with the approved QA/QC Plan. Section 2.1, page 2-3, of the QA/QC Plan states: “The QCSM’s daily activities will include assimilation of data for, and preparation of, the Daily QC Report...”. There is no discussion in the QA/QC Plan about an <i>assistant</i> QCSM preparing the daily QC report. In fact, there is no discussion about an <i>assistant</i> QCSM at all, either from a minimum qualifications standpoint, or concerning the roles and responsibilities of an <i>assistant</i> QCSM. An <i>assistant</i> QCSM was never agreed to by the agencies. In fact, the QA/QC Plan requires the QCSM’s qualifications to be submitted to EPA and CDPHE, for approval prior to commencing their QCSM duties. Therefore, the preparation of the Daily QC Report by anyone other than the QCSM is a project nonconformance item that must be addressed in this report prior to approval by the agencies.</p>	Text has been modified for clarity.
39	<p>Section 9.2, page 48 – The “small swale” briefly mentioned in this section requires more discussion. It is the agencies’ opinion that this feature is neither “small” nor a “swale”, and should be fully described in this report. This element was constructed without a full understanding or approval by the regulatory agencies. In fact, the agencies were notified</p>	Text was added throughout the CCR to address the drainage of stormwater at the east face.

	of this item after it was completed. Please further describe the sequence of events that lead to this feature being incorporated into the project.	
<b>Tables</b>		
40	Table 6.1, General – The Table should also show the expected number of tests required, with respect to the frequencies listed in the QA/QC Plan. For example, the first row of the Table shows the 6-inch cushion soil. With 984,224 ft <sup>2</sup> of material placed, and a required QC frequency of 1 test per 5,000 ft <sup>2</sup> , the expected number of QC tests would be 197 tests (984,224 / 5,000 = 197). The 209 QC tests taken satisfy this requirement. This should be completed for each QC and QA action, where appropriate.	The table has been modified to address this comment.
41	Table 6.3, Test CL-104 – The in-place moisture content is shown as 8.7%, and the optimum moisture content (OMC) is listed as 10.8%. This is 2.1% less than OMC, with a requirement of ± 2% of OMC. Although the moisture content is out of specification, the test result is shown as passing. Please check.	The table has been modified to address this comment.
42	Table 6.3, last 13 entries – The data for the tests from April 21 through May 12 are not for cover soil material, but rather for backfill material (aeration structure, GWIS, and culverts). The compaction specification for backfill is different than for the cushion soils, yet the column header still shows a 95% requirement. Please check and correct.	The table has been modified to address this comment.
43	Table 6.3, Notes – For the asterisk (*) note, please remove the word “slightly”. The test either achieved the specification or did not. Also, we agree with the conclusion that the material was acceptable, but specifically state that CQAE was part of that decision.	The table has been modified to address this comment.

<b>Figures</b>		
44	Figure 3 – a) There are three arrows with the callout “Approximate Liner Anchor Trench” in the northeast footprint area. However, one arrow is pointing to the toe of slope. b) The dashed line representing the anchor trench in this area appears to be about mid-slope. This is confusing. c) The symbol for the anchor trenches should be consistent, either solid or dashed lines, but not both. Please check and clarify the above.	The figure has been modified to address this comment.
<b>Drawings</b>		
45	As-Built Topographic Survey, Sheet 2 – a) The title block states that drawing represents the as-built survey as of May 17, 2005. Has there been additional work since May 17, 2005 that would change the drawing as shown? If so, it must be incorporated into the certification report before regulatory approval is granted. The drawing should represent the absolute final condition of the landfill. Please change the title block accordingly.	The “as-built” survey drawings have been revised to show the work conducted after May 17, 2005.
	b) There are a series of symbols, assumed to represent the riser pipe or vent, which are so close together that they are unreadable. This is near the center of the east slope, between the anchor trenches. Please revise for clarity.	The drawing has been modified to address this comment.
	c) The callout for the “Existing Overflow Spillway” shows two arrow leaders, one hand drawn and the other apparently crossed-out. At a minimum, the crossed-out part should be initialed and dated, consistent with the document etiquette procedures in the QA/QC Plan. Alternatively, the drawing should be electronically corrected prior to inclusion with the final Certification Report.	The drawing has been modified to address this comment.
<b>Appendix A – Design Drawings and Construction Specifications</b>		
46	Drawings, General – In addition to the August 2004 and	These drawings have been added to the appendix.

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	January 2005 sets of drawings, a partial set of revised drawings was issued with a cover sheet date of April 2005. For completeness, these drawings should also be included in Appendix A.	
<b>Appendix D - Submittals</b>		
47	Appendix D-1, Submittal Log, General – There are several submittals shown in the log that were required to be resubmitted prior to approval. The ultimate status of these submittals is unclear. Please check and correct the log as necessary, to document the final status of the following submittals: 104, 119, and 138.	The log has been updated and submittals added to the appendix.
48	Appendix D-1, Submittal Log, Submittal No. 31 – Please explain why a date of 5/16/05 is shown for the submittal being returned, yet verbal approval was given 9/28/04. What happened that took seven months to resolve?	Nothing was left to resolve. Approval was provided to Stoller on September 28 after the information on the type of fuel used by the cement kiln was provided to Stoller by the CKD supplier.
49	Appendix D-2, Technical and Material Submittals, Submittal No. 39 – The CQAE has not initialed this submittal for acceptance. Please check.	The submittal was approved by the CQAE and the submittal form replaced in the appendix.
50	Appendix D-2, Technical and Material Submittals, Submittal No. 48 – The incorrect submittal number “38” is shown and circled. Besides being confusing, it does not conform to the approved QA/QC Plan, Section 2.3.2. Please check and correct.	48 is the correct submittal number and has been corrected on the submittal form and replaced in the appendix.
51	Appendix D-2, Technical and Material Submittals, Submittal No. 66 – This submittal has a “Revise and Resubmit” status, but the revised submittal is not found. Please check and correct.	The re-submittal, as shown on the log, was submitted by Stoller as Submittal 82 and subsequently approved.
52	Appendix D-2, Technical and Material Submittals, Submittal No. 69 – The acceptance status of this submittal is confusing. Was the additional material requested on the Bentomat ST material submitted and accepted by CQAE?	This submittal has been checked and the correct information provided in the appendix.

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	If so, where is that information located? Please check and clarify what happened on this submittal.	
53	Appendix D-2, Technical and Material Submittals, Submittal No. 78 – It is unclear who wrote the hand written note in the bubble. Also, were the requested nuclear density gage results at this location ever provided? How well did they match with the sand cone? Finally, CQAE needs to initial and date this submittal.	This submittal has been checked and the correct information provided in the appendix.
54	Appendix D-2, Technical and Material Submittals, Submittal No. 82 – CQAE should review, initial and date this submittal if approved.	This submittal has been checked and the correct information provided in the appendix.
55	Appendix D-2, Technical and Material Submittals, Submittal No. 91 – a) This submittal presents the gradations for the rock layer. According to Specification 02222, Part 2.01 A.1, the required percent passing the 1.0-inch sieve is 10 – 35 percent. The “Spec for % Passing” column in the test results incorrectly shows this as 15 – 35 percent. This should be corrected on each of the test result sheets.	This submittal has been checked and the correct information provided in the appendix.
	b) Out of specification values were noted in the tests results. CQAE should review and determine the acceptability of the following nonconformance items:	The RL-1 sample was re-tested. See test results RL-1R.
	RL-1 6" result 71.20 spec 50 – 67	
	RL-1 3/8" result 16.88 spec 5 – 15	
56	Appendix D-2, Technical and Material Submittals, Submittal No. 92 – Was the additional information requested by CQAE provided? Please include and link back to this request.	This submittal has been checked and the correct information provided in the appendix.
57	Appendix D-2, Technical and Material Submittals, Submittal Nos. 94, 96, and 107 – CQAE should review, initial and date these submittals if approved.	These submittals have been checked and the correct information provided in the appendix.
58	Appendix D-2, Technical and Material Submittals,	This submittal has been checked and the correct information

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	Submittal No. 119 – Was the additional information requested by CQAE provided? Please include and link back to this request. Also, CQAE should review, initial and date this submittal if approved.	provided in the appendix.
59	Appendix D-2, Technical and Material Submittals, Submittal No. 122 – Was the additional information requested by CQAE provided? Please include and link back to this request.	This submittal has been checked and the correct information provided in the appendix.
<b>Appendix E – Requests for Information</b>		
60	RFI 24 – The “Rejection” box in the “Reply to Subcontractor” section should be checked.	This RFI has been checked and the correct information provided in the appendix.
61	RFI 39 – The RFI from the subcontractor and response indicates that the forms are attached. Please include these in the final report.	This RFI has been checked and the correct information provided in the appendix.
62	RFI 40 – The scratched out wording in the Reply to Subcontractor section does not adhere to the approved document etiquette, Section 2.3.2 of the QA/QC Plan. Please address this nonconformance. Also, CQAE should review, initial and date this RFI if acceptable.	This RFI has been checked and the correct information provided in the appendix.
63	RFI 42 – CQAE should review, initial and date this RFI if acceptable.	This RFI has been checked and the correct information provided in the appendix.
64	RFI 81 – Please provide the list of questions and associated responses referenced in this RFI as part of the Final report.	This RFI has been checked and the correct information provided in the appendix.
65	RFI 131 – The regulatory agencies never supported this major design change. We believe that the use of scrapers and follow-up ripping and diking resulted in a less conservative construction approach, compared with the initial specification of not using scrapers to place the infiltration soil layer. Please document this fact in this RFI.	Comment Noted
66	RFI 215 – The regulatory agencies stated unequivocally that pushing the 22-inch final cover material downhill from the	This RFI has been checked and the correct information provided in the appendix. Placement of the soil cover at the east face was



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	crest of the east face was not appropriate. Please discuss how this RFI was accepted knowing that the regulatory agencies were not in agreement with the concept.	resolved in the field with the regulators and no soil was pushed directly down the slope of the east slope. The RFI notes this discussion in the field with the regulators.
<b>Appendix F – Construction Quality Control Documentation</b>		
67	General – Please see Comment 3 above related to lack of timely review and approval of the QC Daily Report. In addition, many of the Daily QC Report forms have missing information, such as the name and date filled in for the QC Monitor. Please check all daily reports and include missing information. This information should be accurately supplied and adhere to the document etiquette section of the approved QA/QC Plan.	The daily QC reports have been checked and the correct information provided in the appendix.
68	Daily QC Reports for September 17 through September 22, 2004 – The statement that “Data lost due to computer failure” is not acceptable for documenting daily QC activities. Upon further discussion with Golder, it was determined that the daily report can be, and have been recreated using the QC monitors’ field notes. The recreated reports using the monitor’s field notes should replace the existing daily reports in the Final Certification Report. How could the daily reports for these dates possibly be approved by the QCSM if he had not reviewed any information? Again, we are deeply concerned about the lack of “quality” added by the QCSM if he just blindly signed all QC Daily Reports months after the day in question, and after the project was substantially completed.	The daily QC reports have been checked and the correct information provided in the appendix. All Quality Control functions were performed by Stoller and Golder. The QCSM was involved throughout the project from beginning to end as documented in all the construction work control documents. The QC daily reports were prepared by Golder, and reviewed by both the QCSM and the QASM on a daily basis. However, there was some confusion on who was to sign the daily QC reports, which is reflected in the signed QC reports in the CCR by the Stoller representative.
69	Sand Cone Density Test CUS-3 – The moisture content is shown as -2.5% from optimum moisture content (OMC), and the requirement is $\pm 2\%$ of OMC. Therefore, this test should be considered a “fail”, however, it is shown as a “pass”. Please check and change.	The QC report has been checked and the correct information provided in the appendix.

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70	Field Density test Log For 10" Cushion, Test Numbers CU-084 and CU-085 – These two tests were out of specification for moisture, yet they are shown as passing tests. Please document these two tests as nonconformance items, and change the Table to show "Fail".	The QC report has been checked and the correct information provided in the appendix.
71	"Alluvial Testing" Red Separator Sheet – The approved drawings calls this material the "24-inch Infiltration Layer". The title for this testing should also be consistent with the drawing nomenclature. (See Comment 1) Please change. Also, check the language beneath the title. The phrase "...and grain sizes ran on them proctors..." ain't good English. Also, "atterbergs" should be "Atterberg limits" (capital A) and "proctors" should be "standard Proctor density" (capital P). Both Atterberg and Proctor are last names of the people who developed the procedures, and should be capitalized.	This sheet has been revised and the correct information provided in the appendix.
72	Appendix F 2.2, General – A separation sheet should be provided between the Geomembrane Repair Log and the Pressure Test Log.	A separation sheet has been added.
73	"Gravels" Red Separator Sheet – Please provide an explanation as to what this section relates to.	Additional information has been added to this separation sheet.
74	"GCL" and "FML" Red Separator Sheet – Please explain why the words "Secondary" and "Primary" are found on these sheet. This cover system does not contain primary or secondary components, but rather is a composite system. Please remove those inaccurate terms.	Terms have been removed.
<b>Appendix G – Construction Quality Assurance Documentation</b>		
75	Appendix G-4, Sample QARL-3 – The 6" material is out of specification for the 12-inch rock layer. The specification requires 50 to 67 percent passing, and the sample result is 74.7 percent passing. Please review and indicate as a	This is not considered a non-conformance issue. Results of re-testing of the rock sample indicated that the rock met the specifications.

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	nonconformance.	
76	Appendix G-5.1, November 9, 2004 Report – a) 1 <sup>st</sup> page – According to Table 4.1 of the QA/QC Plan, the GCL bentonite specification is a maximum moisture content of 12 percent. All of the conformance test results indicate moisture contents significantly higher than the specification, up to about 29 percent. Please review and discuss.	This is not considered a non-conformance issue. The specification refers to the bentonite as it is supplied to the manufacturer of the GCL; not the moisture content of the final product (GCL).
	b) 2 <sup>nd</sup> page – The result of conformance testing for large scale internal direct shear (ASTM D 5321/Modified) shows a value of 394.7 psf. Table 4.1 of the QA/QC Plan shows an internal shear strength specification of 500 psf, according to ASTM D 6243. Please discuss these results.	This is not considered a non-conformance issue. See the e-mail explanation directly behind this test report.
	c) 3 <sup>rd</sup> page – The first row of the tensile strength (ASTM D 6693) results show a value of 795.5 percent. According to Table 4.1 of the QA/QC Plan, the specification for smooth geomembrane is 800 percent. Please review and discuss.	This is not considered a non-conformance issue. The average tensile strength of the material is well over 800% as presented in the Appendix G.
	d) 4 <sup>th</sup> page – Typo for the puncture resistance test. The correct ASTM designation is “4833”.	Designation has been corrected.
77	Appendix G-5.1, March 21, 2005 Report, GCL Flux – A value of $5.9 \times 10^{-9}$ cm/sec is shown for the Bentomat ST composite permeability (ASTM D 5887). According to Table 4.1 of the QA/QC Plan, the minimum permeability should be $5 \times 10^{-9}$ cm/sec. The tested value is greater than the specification. Please review and discuss.	The result of this test was incorrectly reported on the summary sheet based on our review of the lab data sheet (included in Appendix G). The test result summary sheet has been corrected.
<b>Appendix H – Hold Point / Release Documentation</b>		
78	Hold Point / Release Forms, General – There are several forms that refer to other information that should be included, but is not. For example, the first Hold Point / Release Form, dated October 19, 2004, states “See Map” for the location of the area covered by this form. The map has not been included. The form for November 9, 2004 states:	The details of all hold point/releases are included in the construction work control plans/documents. A review of the information has shown that only a couple of forms have maps for clarity. Most forms are supported by hard copy control point data. The conformation that the layers of the cover have been correctly placed at the designed thickness is included in Appendix

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	<p>"See attached point list". That attachment has not been included. Please review all Hold Point / Release Forms for referenced material, and include all in the final Certification Report.</p>	<p>L. The addition of all the hard copy survey data into this appendix will not add additional information not already presented in Appendix L.</p>
<p><b>Appendix L – Record Surveys</b></p>		
79	<p>Record Survey Spreadsheets, General – Significant figures of the survey data should be consistent. The majority of the data contain two significant figures, however some entries have others. For example, look at the elevations for the 12-inch rock layer. Point 10179 has zero, point 10176 has one, point 10175 has two, and point 10174 has three significant figures. Please check all spreadsheets and change all for consistency.</p>	<p>The table entries have been corrected to 2 significant figures.</p>

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<b>A. GENERAL COMMENTS</b>		
	<b>Comment</b>	<b>Response</b>
<b>1</b>	<p>The report is incomplete. Key missing items include, and are not limited to, the following:</p> <ul style="list-style-type: none"> <li>a. a discussion of the East face slope-related activities performed after May 20, 2005;</li> <li>b. groundwater intercept system (GWIS) piping modification as described in the Interim Measure/Interim Remedial Action (IM/IRA);</li> <li>c. groundwater monitoring well installation;</li> <li>d. records of quality assurance/quality control (QA/QC) reports. The QA/QC records should reflect all construction activity at the Present Landfill (PLF), including all work performed after the demobilization of the main contractor, Stoller.</li> <li>e. Design changes and supporting calculations and materials on the East Face channel reconstruction approved August 1.</li> <li>f. Design calculations and work plan for regrading on the East Face north slope where the road above the pond was removed and the tension cracks were observed October 3, 2005</li> </ul>	<ul style="list-style-type: none"> <li>a. These activities have been added to the Closeout Report &amp; CCR in various sections of the report, but specifically in Section 2 and 4 of the CCR.</li> <li>b. The GWIS system is discussed in Section 4.13 of the CCR. The GWIS system is also shown in the "as-built" survey drawings and the construction photo log.</li> <li>c. Text on the installation of the downgradient groundwater monitoring wells has been added to various sections, but specifically Section 4.18 of the CCR.</li> <li>d. QA/QC reports have been added to Appendix F &amp; G for the installation of the east face stormwater drainage channels.</li> <li>e. Appendix N and O have been added to the CCR to include the post construction stability calculations and design of the east face stormwater drainage channels.</li> <li>f. The area of surface soil cracking (noted in August 2005) has been regraded in the process of building the east face stormwater drainage channels. This regraded surface is reflected in the revised "as-built" survey drawings in the CCR.</li> </ul>
<b>2</b>	<p>The document discusses 20 design changes and 24 field changes. It is not clear from the documentation how these changes were implemented. Because the regulators were sometimes not consulted or aware of all the changes before they were made, the document should include a table (example provided) listing the applicable initial dated approved design drawing or specification; the RFI or other basis for the proposed change; the proposed design change or field change; the date the change was made and approved by the design engineer; the date of EPA /CDPHE concurrence or</p>	<p>The discussion presented in the CCR provides a sufficient level of detail needed to document design and field changes.</p>

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	approval; and the reference in the final as-built drawing or specification. Design changes should include deviations from requirements of the design approval letter, including some coverage of how the cover soil issue was resolved.	
3	Implementation of the Quality Assurance system is poorly documented in this report. It is an important part of the construction record. The quality assurance system for this project was largely deficient. For example, RFI logs were supposed to be available to regulators and others throughout construction, however RFI logs were not available to the regulators until April---8 months into construction. In another example, regulators were supposed to review qualifications and concur on the choice of QCSM per the details of the QA/QC manual. The initial QCSM had considerable experience in implementing quality systems. After some disputes over whether specifications were being met, regulators asked where the QCSM was and were told on 4/14/05 that it had always been Jim Ericson at Stoller, and received his resume at that time. The closeout report indicates it was an unnamed individual at Golder on behalf of Stoller. Change of personnel is an example of a non-conformance.	<p>All Quality Assurance daily reports and testing reports are included in Appendix G of the CCR as performed by Tetra Tech.</p> <p>All RFIs and RFI logs were maintained by both Stoller and K-H.</p> <p>All Quality Control functions were performed by Stoller and Golder. The QCSM was involved throughout the project from beginning to end as documented in all the construction work control documents. There was no actual change in QCSM personnel throughout the project. The QC daily reports were prepared by Golder, and reviewed by both the QCSM and the QASM on a daily basis. However, there was some confusion on who was to sign the daily QC reports, which is reflected in the signed QC reports in the CCR. A letter from Stoller summarizing the QC role of Stoller is included in Appendix F of the CCR.</p>
4	Non-conformances are not mentioned at all. A section listing all non-conformances and how they were resolved should be added. The State has more specific examples of this.	A non-conformance section has been added to Section 6 of the CCR.
5	The report often refers to approvals without specifying who approved what. Since approval can imply regulator approval where there is none, be specific in all instances who approved the detail being described.	Clarifying text has been added throughout the CCR.
<b>B. SPECIFIC COMMENTS</b>		
1	<u>Closeout Report, Section 1.1.</u> This section briefly describes the historical information about the Present landfill (PLF). The section should state explicitly that the PLF contains hazardous materials	Clarifying text has been added here from the regulatory agency approved IM/IRA.

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	(IM/IRA language).	
2	<b>Closeout Report, Section 2.0.</b> This section discusses accelerated actions at the site. The last paragraph identifies "ER accelerated action activities...." "ER" is undefined, but should be defined and listed with the acronyms on Page ii of the report.	Clarifying text has been added.
3	<b>Closeout Report, Section 2.1.</b> This section identifies construction activities and components of the constructed PLF. The following key items should be listed in this section: East face strip drain system; East face surface water control system; the Lower Liner Anchor trench on the East face; and the Groundwater Interception System (GWIS) piping.	This section of the closeout report is meant to be a high level outline of the accelerated action with details provided in the CCR. However, text has been modified for clarity.
4	<b>Construction Certification Report (CCR), Table of Contents (TOC).</b> This TOC should identify the key items listed in Comment Number 3. Sections of the CCR should then describe the construction of these items.	The TOC has been modified for clarity.
5	<b>CCR, Section 2.2.</b> This section was intended to describe the construction of the western portion of the PLF. The first paragraph states "The eastern portion of the PLF closure was started following verbal approval of the East Face design prior to completion of the western portion." This sentence is inaccurate and also misplaced, because it refers to construction activities which should be discussed in Section 2.3 Eastern Portion Construction.	The text in this section has been modified for clarity.
	All work performed east of "the 5980 line" was conducted under approved Work Plans. There were at least 7 work plans for this work, including the following:	The listed items have been added to the CCR text, Section 4.12.
1)	East Landfill Pond Sediment Removal Plan, dated November 23, 2004, (approval date to be filled in by K-H)	
2)	Section 1 East Face Work Plan, dated January 21, 2005, approved 1/21	
3)	Section 3 East Face Work Plan, dated January 21, 2005, approved 1/24	
4)	Section 2 East Face Work Plan, dated February 3, 2005, approved 2/23	

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5)	Liner Installation Work Plan (Between the 5980 line and the crest of the existing slope), dated February 3, 2005, approved 2/11	
6)	PLF Strip Drain Installation Notes, dated February 11, 2005 (approval date to be filled in by K-H)	
7)	6-inch Cushion Soil Installation Work Plan, dated March 10, approved 3/11	
	No verbal approval of an East Face design was ever provided with written confirmation. This sentence should be deleted from this section and inserted, with corrections and additional details, in Section 2.3 Eastern Portion Construction, where the description of work east of the 5980 line is provided. This section should be revised to list the Work Plans under which work was performed east of "the 5980 line" and the dates approved by EPA.	The text has been modified to remove the reference to "verbal approval."
6	<u>CCR, Section 2.</u> A sub-section should be added to this section. This should describe all the activities related to the swale, revised surface water control, and re-grading of the toe of the East Face of the PLF.	Text has been added throughout Section 2 to add these activities.
7	<u>CCR, Section 5.2, Page 31.</u> This section discusses the design changes.	
	The second design change states..."To meet requirements of the regulatory agencies to provide some fines..." The sentence should be revised to indicate that addition of fines to the biota barrier layer was not a regulatory requirement and did not change the functioning of the rock layer as a biota barrier.	The addition of fines to the rock layer was a regulatory request that was agreed to in a PC/PLF Project Team meeting in December 2003. Clarification has been added to the text.
	The ninth design change refers to "PLF grading changes" as discussed in design change No. 2. There are no grading changes discussed in design change No. 2. The correct reference should be cited in this paragraph.	Text has been changed to reflect number 4 instead of number 2.
	The eighteenth design change eliminated the flow meter from the original seepage collection system. This paragraph should indicate that EPA did not support or concur with this change, and that a meter may still be required at a later date.	The text has been modified for clarity.
	Figure 51781-013A (Issue 2) of the approved design, signed March	Additional design drawings have been added to Appendix A to



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	18, 2005, shows a drain in the lower anchor trench on the East face of the PLF. The design change approved by the engineer that removes the drain from the lower anchor trench on the East face of the PLF should be provided.	show this transition in design.
8	<b>CCR, Section 5.3, Page 33.</b> This section describes the East Face subsurface investigations and final design. Because calculations are still in progress, this section should be revised to include the final results when available, including but not limited to the following: The stability analysis for the as-built cover The option analysis and revised swale design The revised grading plan for the toe of the PLF	  Stability analysis has been added to CCR in Appendix N The design of the stormwater drainage channels has been added to the CCR in Appendix O. The revised grading of the east face is shown on the "as-built" survey drawings that were revised after the stormwater drainage channel construction was completed on the east face.
9	<b>CCR, Section 5.4, Page 36.</b> This section describes field changes. The first field change implies all contaminated materials and asbestos materials encountered during excavations were removed and disposed of off-site. The last sentence should be clarified to indicate "...asbestos materials, not under the final RCRA cover, were removed and disposed of off-site." The twenty fourth field change is still in progress. This section should be revised to incorporate a discussion of the final design and constructed features for this change.	 Text has been modified. Text has been modified and additions to the various appendices made to reflect the design and construction of the stormwater drainage channels on the east face.
10	<b>CCR, Figure 3.</b> This figure indicates the key features of the PLF. The location of the Top Liner Anchor Trench and extent of the final soil cover should be indicated and identified. The figure also incorrectly indicates that the toe of the slope and the approximate middle of the slope are also locations of a liner anchor trench. This is incorrect. These errors should also be corrected.	Revisions to Figure 3 have been made for clarity.
11	<b>CCR, AS-BUILT SURVEYS NEW SEEP SYSTEM.</b> This	This has been clarified on the survey drawing. Point 64

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	shows the as-built elevation of the seep control systems. It is not clear what the elevation numbers represent. For example, Point 43 (El. 5939.16) will not allow drainage to gravity flow to Point 64 (El. 5946.59). Notes or additional information should be added to the drawing to clarify what the elevation numbers represent.	represents the elevation of the top of soil at the vertical piping (cleanout) of the existing seep system. Point 43 is a location at the top of the strip drain.
12	<b><u>DRAWING NO. 51781-11 (Issue 2) and 13A (Issue 4).</u></b> The indicated sections and details do not appear to reflect as-built conditions and details. In particular, the East face slope in Drawing 11, Section A - A'; and the toe of the slope and the detail of the drain trench in Drawing 13, appear to be in error. These drawings should be corrected.	The "as-built" design drawings have been revised.